Reflux and cough

### S29
**COUGH FREQUENCY AND MORBIDITY IN INPATIENTS WITH ACUTE RESPIRATORY DISEASE**

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Introduction Cough is the unique respiratory symptom. Although associated with a range of conditions it has been little studied in acute respiratory disease. We describe cough frequency and cough-related quality of life in this group.

Method Participants had a diagnosis of acute exacerbation of asthma (asthma), chronic obstructive pulmonary disease (AECOPD), or lower respiratory tract infection (including community-acquired pneumonia) in the absence of the other respiratory disease (LRTI). Quality of life was measured with the Leicester Cough Questionnaire (LCQ-acute), cough severity with a visual analogue scale (VAS) and 24-hour cough frequency with the Leicester Cough Monitor.

Results 40 patients were recruited within a median (interquartile range) of 1 (1–2.3) day (±) of hospital admission. Median (IQR) age was 57 (41–71) and 63% were female. Geometric mean ± log10 SD cough frequency was high: 19.7 ± 1.36, 33.8 ± 2.02 and 23.6 ± 1.31 coughs/h for asthma (n = 11), AECOPD (n = 15) and LRTI (n = 14) respectively (Figure); median (IQR) cough bouts/24h: 81 (54–210), 148 (97–197) and 129 (67–197). There was no significant difference between disease groups in these values (p > 0.05 for all two-way comparisons). Diurnal variation and median numbers of coughs/bout were similar between groups. The 48% of patients who were current smokers coughed more than non-smokers (33.6 ± 1.91 vs 20.2 ± 1.38 coughs/h, p = 0.07). No difference in cough frequency was detected amongst the 25% taking angiotensin converting enzyme inhibitors. Gender had no significant overall effect.

Median (IQR) VAS scores were 39 (32–86), 73 (53–100) and 82 (48–91) for asthma, AECOPD and LRTI respectively with no significant difference between them. Cough severity showed a significant correlation with 24-hour cough frequency overall (Spearman’s coefficient 0.33, p = 0.05). LCQ-acute scores were lower for LRTI (8.4; 6.4–9.5) than asthma (14.7; 10.7–17.5); p = 0.01 (Figure 1). Neither was significantly different from those for AECOPD (11.5; 8.5–15.6). Quality of life did not correlate with cough frequency (Spearman’s coefficient -0.13; p = 0.48).

Conclusion Cough frequency in acute respiratory disease is high but with high variation. Cough frequency accounts for only part of morbidity in these conditions.

### S30
**SALIVARY PEP SIN AS A BIOMARKER OF AIRWAY REFLUX IN IDIOPATHIC PULMONARY FIBROSIS - AN OBSERVATIONAL STUDY**

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Introduction and Objectives Current understanding of IPF proposes repetitive pulmonary epithelial injury with aberrant healing as a principal mechanism. Gastro-oesophageal reflux (GOR) and micro-aspiration of gastric contents may cause lung injury with subsequent fibrosis, and GOR is known to be prevalent in IPF patients. We assessed the feasibility of salivary pepsin measurement in IPF patients and investigated the temporal variability and relationship between salivary pepsin and symptoms.

Methods IPF patients collected saliva samples at multiple time points over the course of one day. Early morning, lunch- and dinner-time samples were analysed and compared with results from a historical control group of 100 healthy volunteers. Samples were analysed for the presence of pepsin using Peptest™ (RD Biomed Ltd). Patients were defined as pepsin positive if they had pepsin detectable in at least 1 saliva sample. The St George’s Respiratory Questionnaire (SQRQ), Hull Airways Reflux Questionnaire (HARQ), and the REFLUX questionnaire were used to assess the relationship between pepsin positivity and symptoms.

Results All 21 IPF patients successfully provided saliva samples, of which 17 patients (81%) were pepsin positive compared to 36 of 100 healthy volunteers (36%), p = 0.0004. The proportion of...
Background Chronic cough (CC) is an increasing problem that is not easy to treat with medication. Associated symptoms include hoarse voice, dysphonia, persistent tickling and irritation of the throat or chest. These lead to poor sleeping and eating patterns, loss of vocal independence and social isolation all resulting in an impaired quality of life. Airway reflux is a common cause of unexplained chronic cough and proton pump inhibitor (PPI) medication is commonly prescribed as initial therapy. The following study assessed pepsin identification in CC patients as a marker of airway reflux on PPI.

Methods Consecutive patients referred to the Hull Cough Clinic were instructed to collect expectorated saliva on three occasions following symptoms (paroxysm of cough). Saliva was collected into tubes containing 0.5 ml of 0.01 M citric acid and analysed for the presence of pepsin using a lateral flow test comprising two unique human monoclonal antibodies to pepsin (Peptest™, RD Biomed Ltd). The cut off value to determine pepsin positivity was 25 ng/ml. Patients also completed the Hull Airways Reflux Questionnaire (HARQ), a validated tool to diagnose airways reflux.

Results 72 patients were included in this study (females 49, mean age 58.3 years). Salivary pepsin assay was positive in at least one sample in 46 (64%). 24, 10 and 12 patients had 1, 2 and 3 positive tests respectively. 10 samples had pepsin levels above 250 ng/ml. For purpose of comparison this data was examined against 300 similar pepsin assays from 100 healthy subjects with no typical or atypical reflux symptoms. In this group only 6 of 300 samples had more than 250 ng/ml of pepsin measured and 64% had all three samples negative for pepsin. This is shown in table 1. The median HARQ score was 30 (range 1–67).

Conclusion A high proportion of patients with chronic cough have demonstrable levels of pepsin in expectorated saliva at the time of having symptoms. This non invasive test may be a useful investigation to support the diagnosis of airway reflux.

Abstract S32 Table 1. Test results for pepsin in patients with chronic cough compared to healthy volunteers

<table>
<thead>
<tr>
<th></th>
<th>At least one sample positive</th>
<th>One sample positive</th>
<th>Two samples positive</th>
<th>All three samples positive</th>
<th>All three samples negative</th>
<th>Pepsin level &gt;250 ng/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic cough patients</td>
<td>63.9%</td>
<td>33.3%</td>
<td>13.9%</td>
<td>16.7%</td>
<td>36.1%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Healthy volunteers</td>
<td>36%</td>
<td>20%</td>
<td>12%</td>
<td>4%</td>
<td>64%</td>
<td>2%</td>
</tr>
</tbody>
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